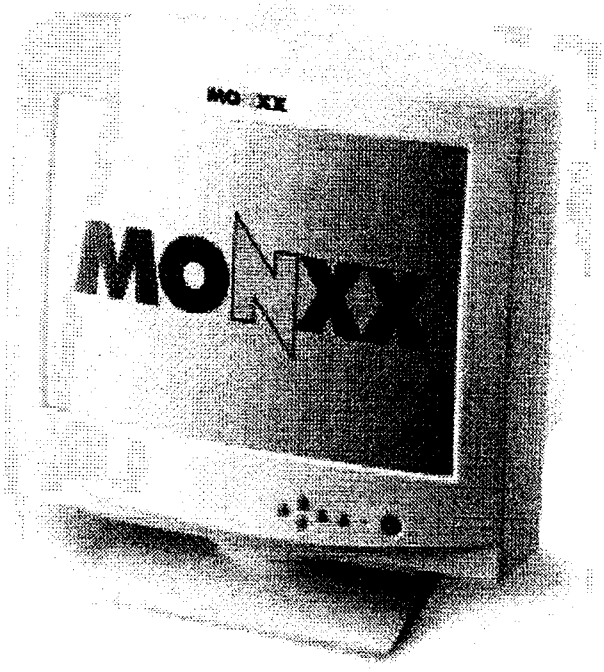
V28842

MONXX

MONXX macht's möglich!



SERVICE MANUAL MONXX995 MONITOR

MONXX995

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CONTENTS

General Features.....2

Monitor connection 3

Operation & User Adjustment.....4

On Screen Display Guide 5

Specifications.....12

Input signal Timing..... .23

Signal Connector 28

Adjustment Guide 29

Circuit Guide 35

Video Circuit Guide 40

Troubleshooting..... 41

Attachment:

Circuit Diagram

General Features

The monitor is equipped with the following general features:

- Flicker-free high resolution color monitor.
- Horizontal scanning frequencies from 30 KHz to 95KHz (using automatic scanning method).
- Vertical scanning frequencies from 50Hz to 150Hz (using automatic scanning method).
- Microprocessor-based design with digital controls and OSD display. (memory for timing modes)
- 10 Presetting and 10 user programmable modes.
- Compatible with standard IBM VGA, 8514A, XGA, Super VGA modes as well as newly proposed VESA ergonomic standards.
- A 19-inch digital display and a 0.25/0.26 mm dot pitch display.
- Horizontal resolution: 1600 dots
  Vertical resolution: 1200lines
- Analog signal inputs to display unlimited number of colors depending on video signal input.
- Universal auto-switched power supply.
- 15-pin D-sub connector .
- Removable tilt-swivel base
  Tilt: -5 ~ 12.5 degrees
  Swivel: ±60 degrees
- VESA-standard power management and DDC 1/2B.

Monitor Connection

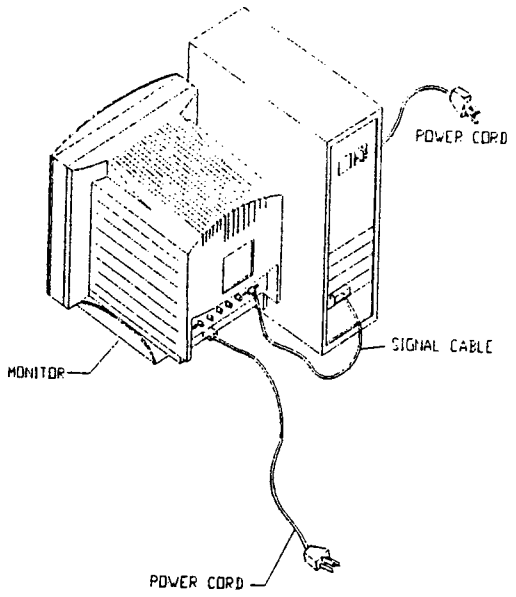


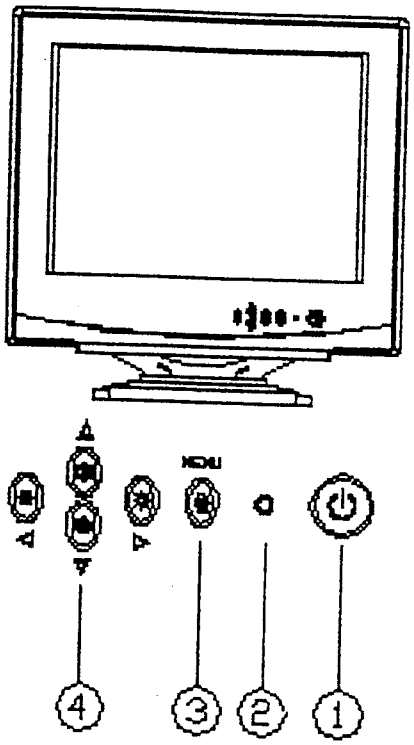
Figure 1: Connecting the Monitor

1 Working with PC

Connect the signal cable (from the monitor) to the D-connector on the back of PC. See Figure1 as shown above.

2 Connect the power cord to the specified outlet, and turn on the power switches of both PC and monitor. Then the picture will be displayed on the CRT screen. Within about 30 seconds adjust the picture with related adjust controls to obtain optimum picture.

Operation and User Adjustment



Control Panel

Figure 2 shows the position of following operating units:

① Power ON / OFF Switch ② Power LED

③ Menu – Displays OSD menu & Scrolls through OSD menu

④ Function Control Key – Adjust level of selected items

On-Screen Display Guide

I. Contrast & Brightness

1) Press "▲" "▼" to activate and make the contrast adjustment shown by the OSD bar. The bar moves rightward indicating contrast increase and leftward indicating contrast decrease.

Figure5 Contrast Adjustment Bar

2) Press "◄" "►" to activate and make the brightness adjustment shown by the OSD bar. The bar moves rightward indicating brightness increase and leftward indicating brightness decrease.

Figure6 Brightness Adjustment Bar

II. OSD Function Menu

1) Press "Menu" key to enter the OSD menu containing 10 functions as shown in figure 7.

2) **Select adjustment function**

Please scroll the preferred function from left-right sequence by pressing "Menu" key. You may return to the previous item by keeping pressing the "Menu" key.

3) **Adjustment Operation**

Make the adjustment using the four function control keys. Please refer to the Figure 7 for advanced operation.

A. OSD contains 10 icons representing the following function adjustments: H-Phase/V-Center, H-Size/V-Size, Pincushion/Trapezoid, PinBalance/Corner, Parallel/Tilt, RGB-Gain, OSD Position, Language, Tool, and Exit.

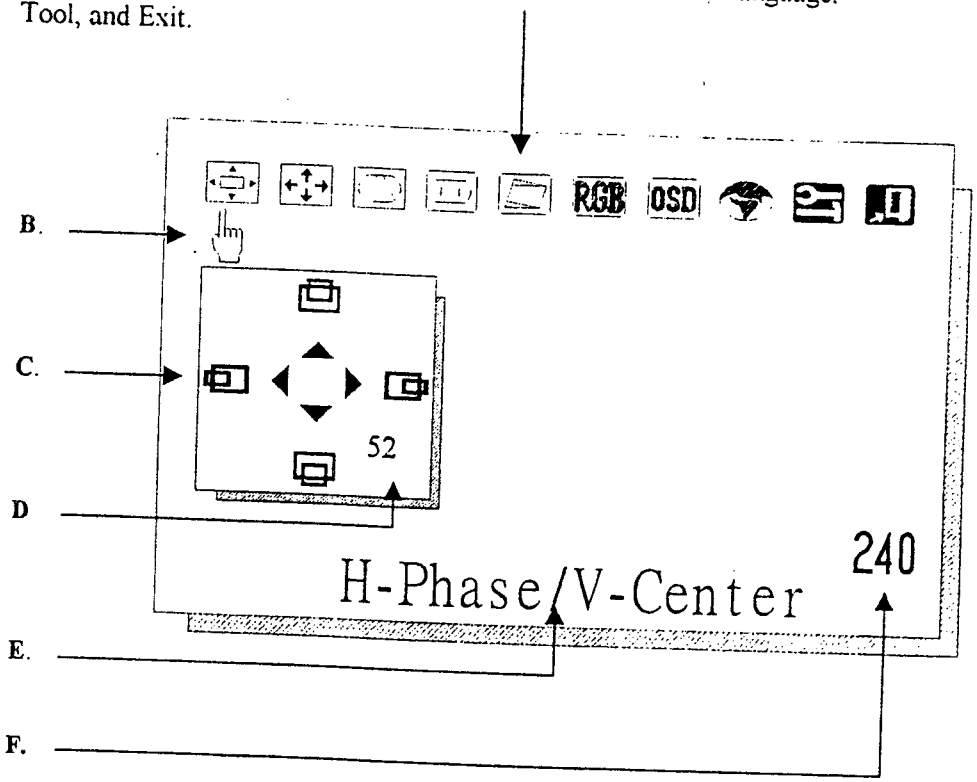


Figure 7 Function Menu

B. Hand-shaped pointer indicates the current function selected.

C. There are four adjustments for each function selected. The icon being selected will turn into a different color.

D. The setting value will appear during adjustment.

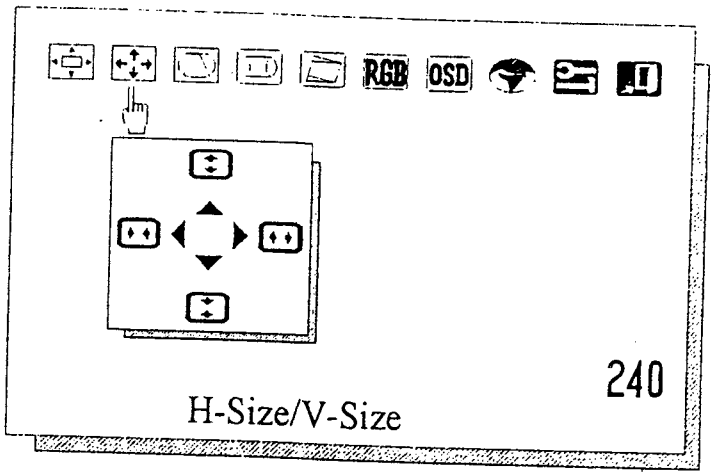
E. Displaying the message of current function selected.

F. The number in the right corner indicates how long the OSD will last for displaying.

① **H-Phase & V-Center function window**

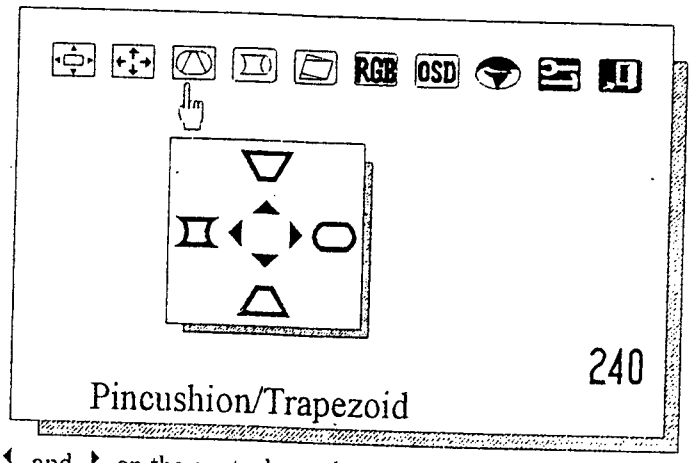
Press ◂ or ▸ key to reposition the picture leftward or rightward.
Press ▴ or ▾ key to reposition the picture upward or downward.
(Please refer to the figure 7)

② **H-size & V-size function window**



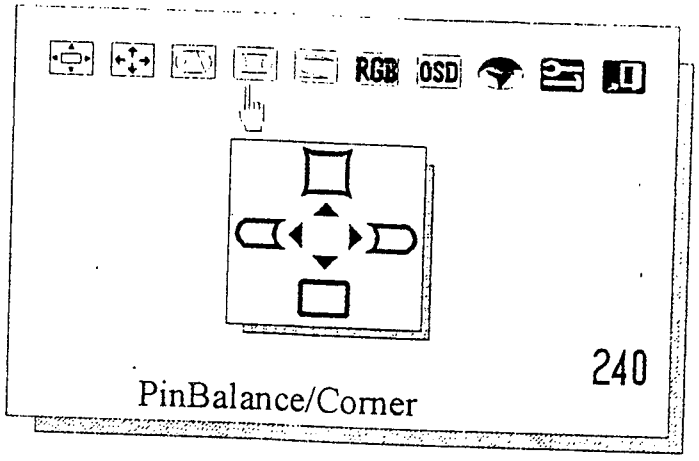
Press ◂ key to reduce the H-size and press ▸ key to enlarge the H-size.
Press ▴ to enlarge the V-size and press ▾ key to reduce the V-size.

③ **Pincushion & Trapezoid function window**



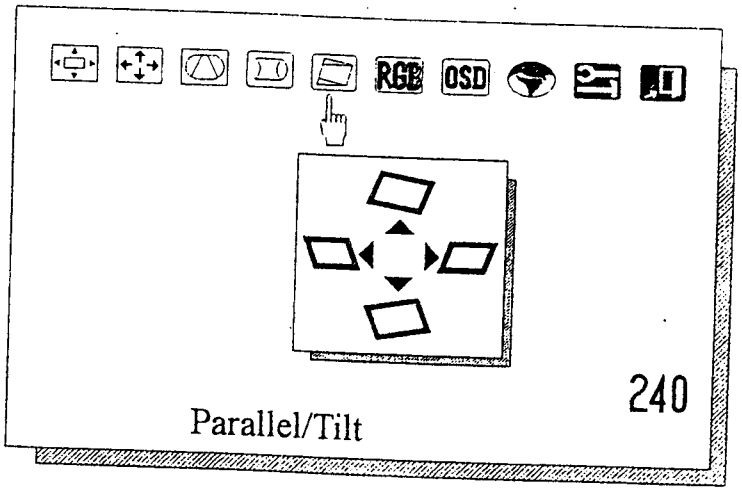
Press key ◂ and ▸ on the control panel to alter pincushion and barrel according to your personal needs.
Press key ▴ and ▾ on the control panel to alter trapezoid according to your personal needs.

④ Pin - Balance & Corner function window



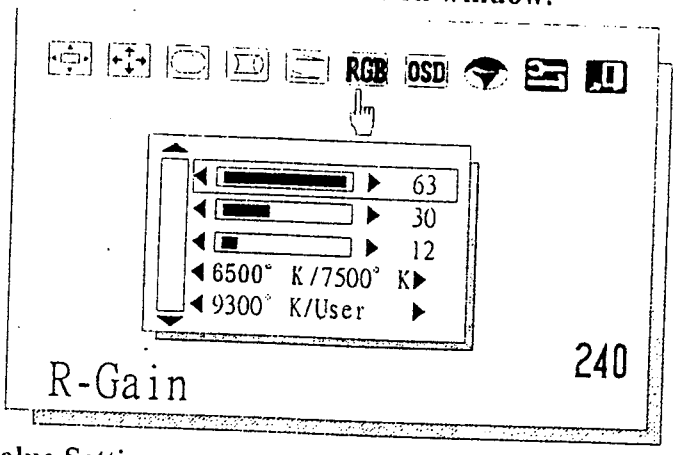
Press " ◀ " and " ▶ " to adjust pin balance .
Press " ▼ " and " ▲ " to adjust corner distortion.

⑤ Parallelogram & Tilt function window



Press " ◀ " and " ▶ " to adjust parallelogram .
Press " ▼ " and " ▲ " to adjust tilt.

⑥ **RGB Color Temperature function window.**



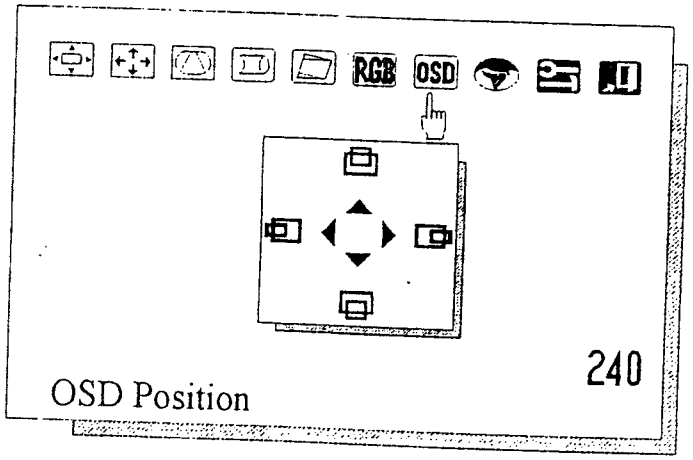
RGB Value Setting

The current setting of the color temperature is presented in purple. Press ▲ ▼ key to move the black bar up or down to your desired item. There are three factory settings available for selection: 6500^0 K , 7500^0 K, and 9300^0 K. For personal preference, you may directly adjust the RGB values separately either in the User's mode or in 6500^0 K, 7500^0 K, and 9300^0 K mode. The values will be stored in the User's mode after leaving the user's function window.

Note

If you previously set 6500^0 K, 7500^0 K, or 9300^0 K to be stored in the User's mode, then the OSD will display these three default settings instead of the User's mode as moving the black bar to select the User's mode .

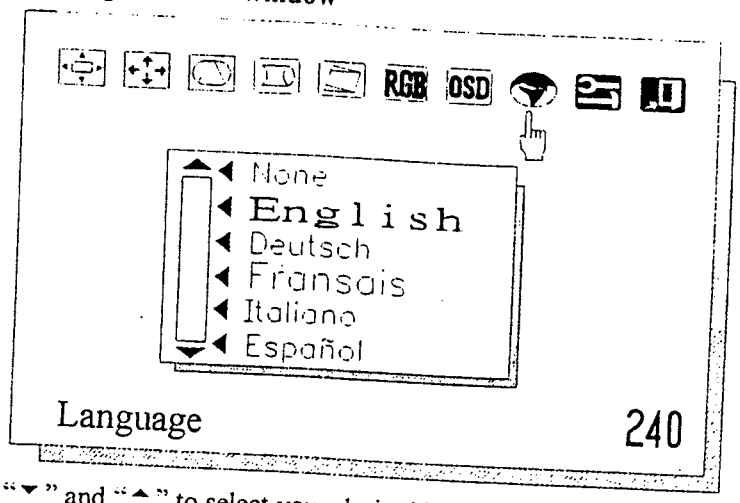
⑦ **OSD position function window.**



You may reposition OSD according to personal needs.

Press ◀ ▼ ▲ or ▶ to move OSD.

⑧ **Language function window**

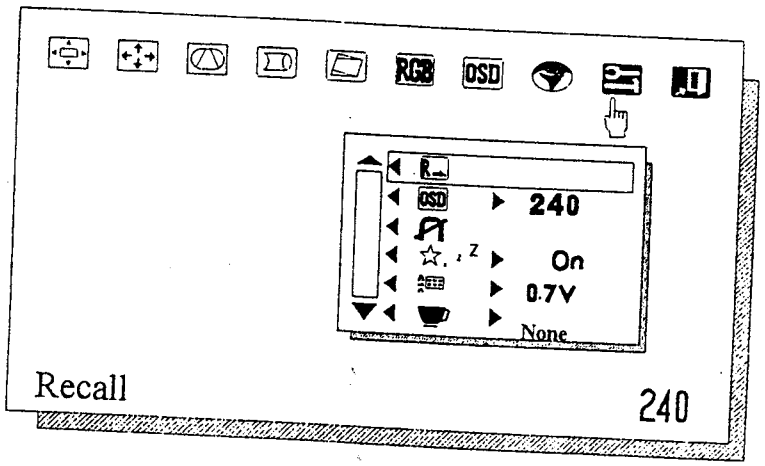


Press "▼" and "▲" to select your desired language, and then the OSD menu will be presented in the language selected.

Note

No message will be displayed if you select "None".

⑨**Tools function window.**



Recall factory setting if monitor H-V frequency is in preset mode including Phase, Size, and Pincushion/Key-stone.

Adjust OSD countdown timer whose duration ranges from 5 to 240 seconds.

Activate the degauss function of CRT.

Enable or disable power saving .

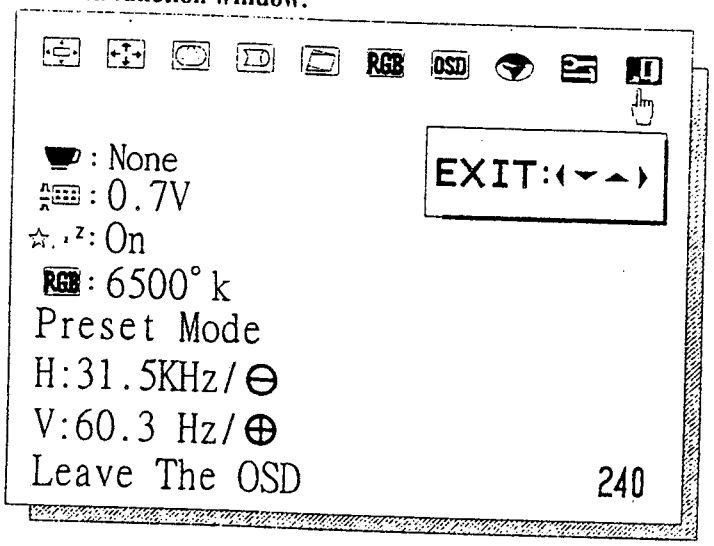
Select the video input level.

Adjust tea time whose duration ranges from 0 to 255 minutes

Note

1. The icon, a cup of coffee, will appear to remind you to take a break.
2. The duration for displaying tea time is about 20 seconds. You may also set the duration for displaying tea time according to personal needs. To terminate displaying tea time, please press any one of the keys or set the duration to None.

⑧ **Exit OSD menu function window.**



The information of current settings such as tea time, video input level, power saving , color temperature , current horizontal / vertical frequency and polarity will be displayed.

Note

If the signal cable is not connected to the PC, then the screen will display the Color Bar Pattern.

Specifications

1. Mechanical Description

1-1 Dimensions

Height : 470.0 mm

Width : 470.0 mm

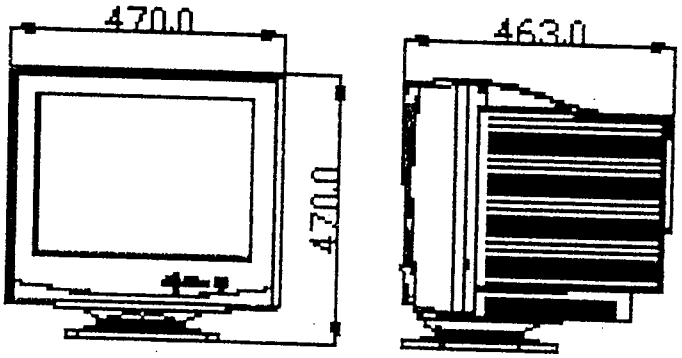
Depth : 463.0 mm

Weight : 19.9 Kg

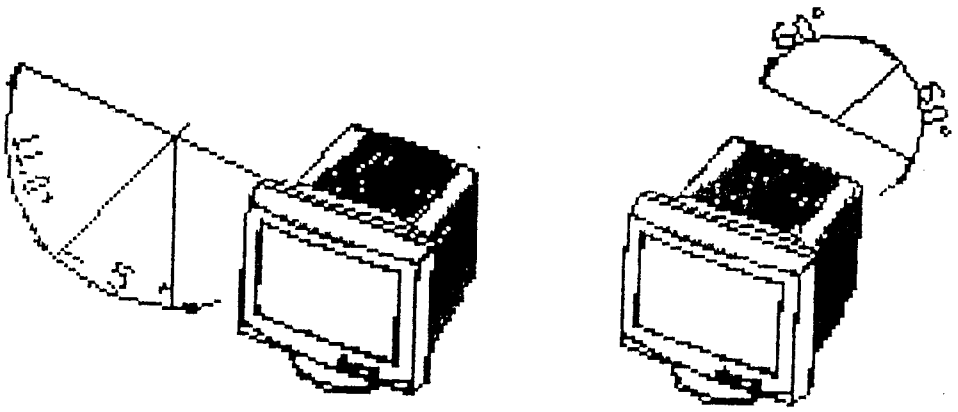
Picture Tube : 19" diagonal , 90^0 deflection

0.25/0.26 mm trios dot pitch, SS-DY

1-2 Dimension Drawings



1-3 Tilt and Swivel Adjustment



2. Environment

2-1 Operating Ambient Temperature, Humidity and Altitude

Temperature : 0^0 C ~ 35^0 C

Humidity : 10% ~ 90%

Altitude : 10,000FT (max.)

2-2 Storage Ambient Temperature, Humidity and Altitude

Temperature : 10^0 C ~ 60^0 C

Humidity : 10% ~ 90%

Altitude : 30,000FT (max.)10.000m

2-3 Shipping Ambient Temperature, Humidity and Altitude

Temperature : -20^0 C ~ 60^0 C

Humidity : 10% ~ 90% (without condense)

3. Vibration and Shock : Package Condition

3-1 Vibration

Frequency: 5Hz ~ 100Hz ~ 5Hz

Acceleration: 1.2G

X-axis, Y-axis, Z-axis : 20 minutes each

3-2 Shock

45 cm high, one corner, three edges, and six sides.

4. Electronic Performance

4-1 Power Supply

Input Voltage: 100 VAC ~ 240 VAC (Universal)

Input Frequency: 50±3 Hz / 60±3Hz

Power: 120W under the normal condition

Inrush Current: 42A0-p (max.) at AC 240V

4-2 Sync.

Separate Sync. TTL level: horizontal sync. (positive / negative)

vertical sync. (positive / negative)

compound Sync. is compatible.

4-3 Video

Input Connector: 15-pin D-sub connector

Signal Level: analog 0.7 Vp-p

Polarity: positive

Display Color: unlimited colors

Video Pix Rate 175 MHz

4-4 Power Management

PMS standard complies with VESA, EPA and NUTEK.

On-state: Green indicator is lit.

Stand-by state: H-sync. Is off and Orange indicator is lit.

Suspend state: V-sync. Is off (less than 15W) and Orange indicator is lit.

Off state: H/V sync. Is off (less than 8W) and Orange indicator flashes.

5 General Definition and Test Condition

Unless otherwise specified, all QA tests to verify specification must be performed under standard operating condition as follows:

5-1 Test Signals

A. Video Generators

CHROMA 2000 or equivalent

B. Timing

See Input Signal Timing

C. Video Mode

VGA text mode

5-2 Warm-up Time

Minimum 30 minutes after power switch on with specified power line voltage and signal applied.

5-3 Direction

A The CRT face should face to east for northern hemisphere usage.

B The unit for southern hemisphere usage should be tested under simulated or actual magnetic fields of southern hemisphere , and the CRT face should face to east.

5-4 Ambient Lighting Environment is 400 to 600 Lux.

5-5 Ambient Magnetic

No special ambient magnetic field exits.

(The AC leakage flux or DC flux causes transformer magnet or the like).

5-6 Ambient Temperature

20 ± 10^{0} C

Less than 2 degrees C fluctuations are allowed during test.

5-7 Inspect Equipment

A Customer Graticule

B MINOLTA TV2130 Color Analyzer or equivalent

C KLEIN convergence error measurement gauge CM7AG

D Microscope 10X

6 Screen Display & Performance Specification

6-1 Image Character Area

Horizontal :350 mm + / -5mm

Vertical : 262 mm +/ - 5mm

6-2 Image Positions

Adjust the picture to the center of screen.

The image position is within the area as shown in Figure 3.

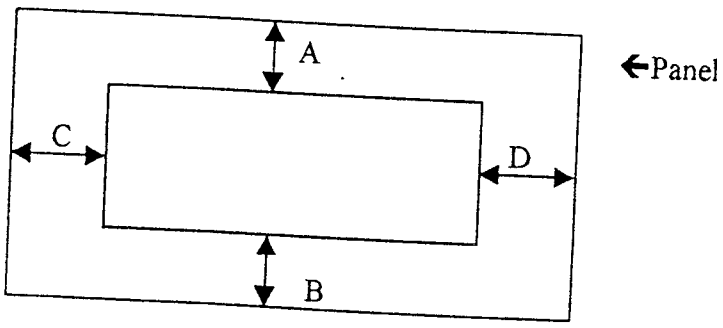


Figure 3

$|A-B| \leqq 4mm$ $|C-D| \leqq 4mm$

(under the normal condition)

6-3 Distortion

A Pincushion & Barrel (Refer to Figure 4)(Test pattern: Cross-Hatch)

A-1. Pincushion

Upper (a): less than 2.0 mm

Lower (b): less than 2.0 mm

Right (c): less than 2.0mm

Left (d): less than 2.0mm

A-2. Barrel

Upper (a'): less than 1.0 mm

Lower (b'): less than 1.0 mm

Right (c'): less than 1.0 mm

Left (d'): less than 1.0 mm

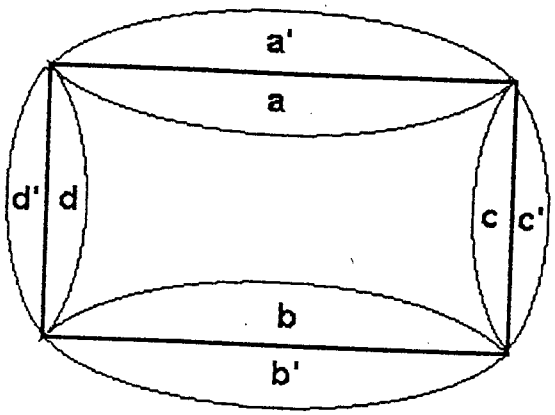
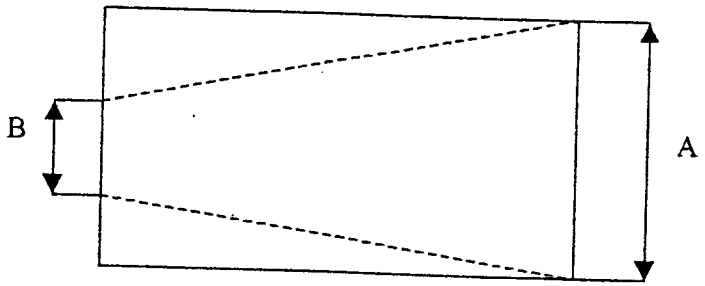


Figure 4

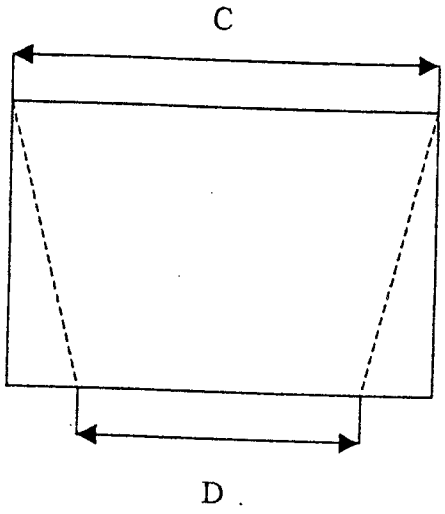
B. Rectangularity & Parallelogram Distortion (Test pattern: Cross-Hatch)

Edge of the image is within area indicated by
the dotted line as shown in Figure 5a & Figure 5b.



$$|\ A\text{-}B\ | <= 2.0\text{mm}$$

Figure 5a Rectangularity



$$|\ C\text{-}D\ | \leqq 2\ \text{mm}$$

Figure 5b Parallelogram

C. Linearity

Witch cross- hatch pattern , horizontal and vertical linearity should less than 10%. The brightness is set 10FtL witch full pattern.

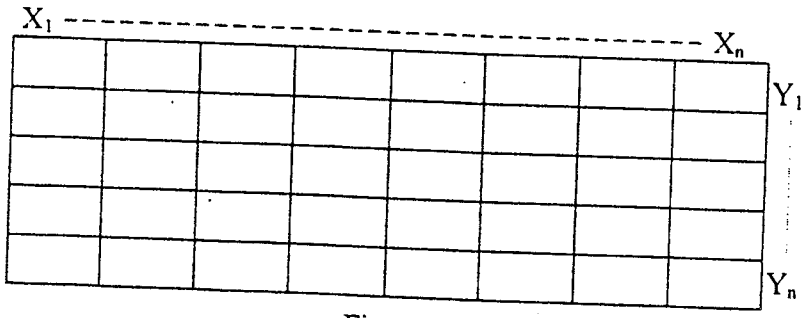


Figure 6

Horizontal Linearity

$$\left| \frac{X_{max} - X_{min}}{X_{max} + X_{min}} \right| \times 100\% \leq 5\%$$

Vertical Linearity

$$\left| \frac{Y_{max} - Y_{min}}{Y_{max} + Y_{min}} \right| \times 100\% \leq 5\%$$

Note: Maximum and minimum values should not be adjacent each other.

X_{max} is maximum value among X_1~Xn.

X_{min} is minimum value among X_1~Xn.

Y_{min} is maximum value among Y_1~Yn.

Y_{min} is minimum value among Y_1~Yn.

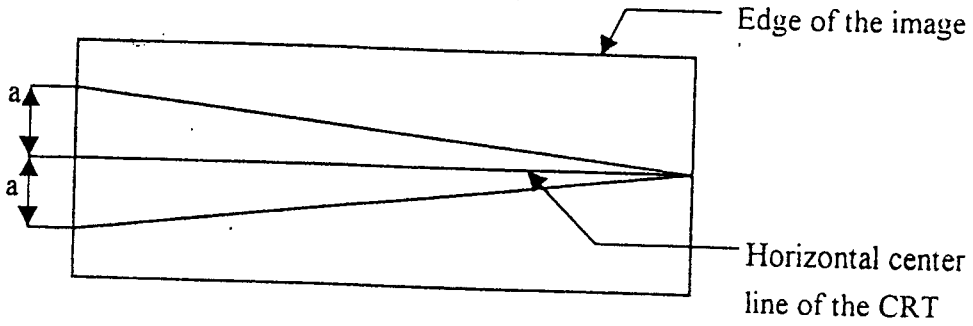
X_{ave} is average.

Xx is each dimension .

Y_{ave} is average.

Y_X is each dimension.

D. Rotation(Input signal: cross hatch. Green pattern)
Horizontal center line of the image should be within the triangle area as illustrated in Figure 7 .

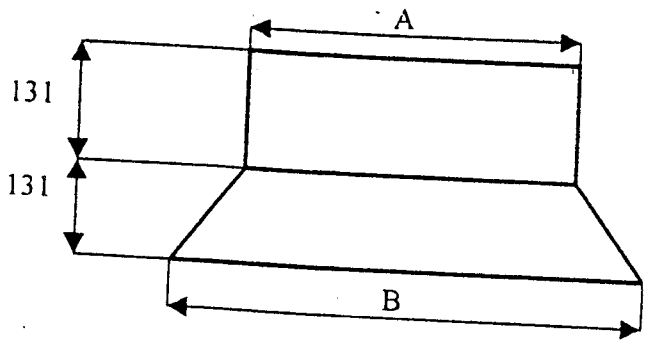


a: represents 1 Character

Figure 7

Notes: 1. It should measured under the following terrestrial magnetic fields.
(1). without horizontal magnetic field
(2). With vertical magnetic field
2. CRT neck should face magnetic west.
3. For TECO plant : a <2.0mm
For Others : a $<0.5^{0}$

6-4 Image Size Variation



A-B≤3.0mm

	image size variation form the normal image size	range of variation
by brightness	within 3mm (horizontal and vertical)	1~Full Beam
by power supply voltage	within 3mm (horizontal and vertical)	AC100V~120V AC220V~240V
by temperature	within 3mm (horizontal and vertical)	$20^0 \pm 10^0$C

6-5 Mis -Convergence

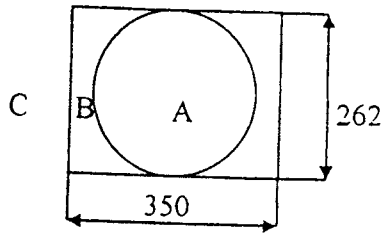
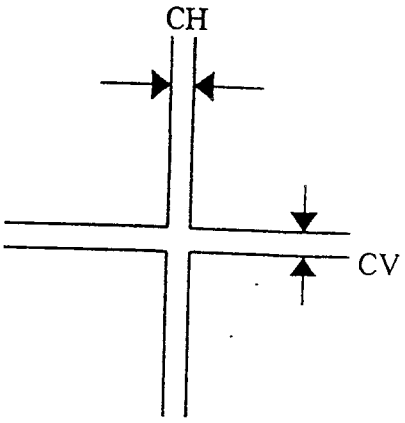


Figure 8

Center of the display area (a)<0.3mm
Peripheral display area (B)<0.40mm Cs≤0.5mm

Note: It should be measured under the following conditions.

1. without horizontal magnetic field (terrestrial)
2. with vertical magnetic field (terrestrial)
3. at room temperature
4. input signal with cross-hatch, R .G. B, mixed color



CH: Horizontal Miscon

CV : Vertical Miscon

$$Cs=\sqrt{CH^2+Cv^2}$$

6-5 Mis -Convergence

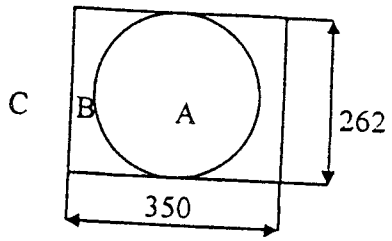


Figure 8

Center of the display area (a)<0.3mm
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Note: It should be measured under the following conditions.

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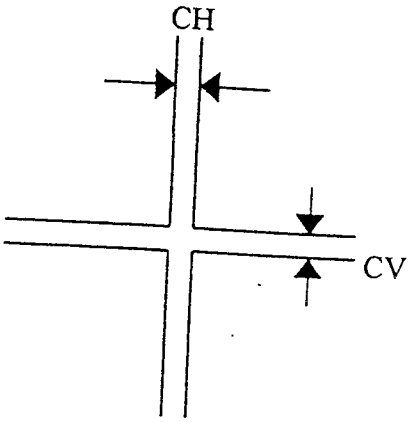
3. at room temperature
4. input signal with cross-hatch, R .G. B, mixed color



CH: Horizontal Miscon

CV : Vertical Miscon

$$Cs=\sqrt{CH^2+Cv^2}$$

6-6 Jitter

No visible jitter is present upon viewing the screen from 0.5 meters.

6-7 Luminance Uniformity

With entire 350mm by 262 mm display area illuminated with white flat field, non-return to zero

No area may be less than 70% of the luminance of the brightness area found on the screen.

6-8 Maximum Luminance

Greater than 27 Foot-Lamberts, with full white pattern,350 mm x 262 mm display area

greater than 45 Foot -Lamberts, 70x70mm, white pattern

6-9 Chromatically

(a)Turn the Brightness control until the raster is just cut off. Turn the Contrast Control.

The Full White Pattern Y≥20FL Xo=0.281±0.020 Y0=0.311±0.020

(b)The Contrast Control keeps the position of item (a0 Brightness Control from Max to Min.

Xe= Xo±0.025 Ye= Yo ±0.025

6-10 Focus

With full white pattern to set luminance at 20FL, change full white pattern to full E pattern to check whether all "E" characters are easy to read and do not fuzzy.

6-11 Power Management

Input Sync.			State	Power Consumption	Recovery Time
H	V	Video			
O	O	Active	On State	Less than 120W	Non-applicable
X	O	Blank	Stand-by	Less than 30W	5 Seconds
O	X		Suspend	Less than 15W	5 Seconds
X	X		OFF	Less than 8W	Same as Cold Start

6-12 DDC

Satisfies the DDC1 and DDC2B specification.

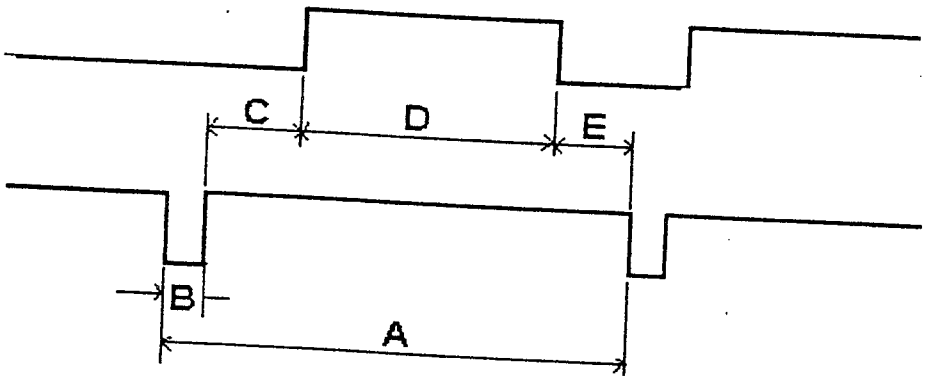
The BNC (optional) is not equipped with the DDC function.

The specifications of the D-SUB connector is shown on page 28

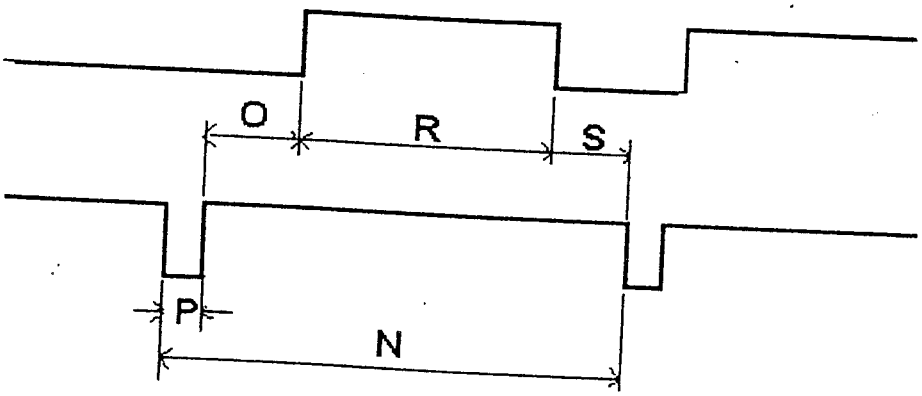
Input Signal Timing

SEPARATE SYNC.

HORIZONTAL



VERTICAL



Sync. Polarity : Positive/ Negative

Preset Timing

MODE ITEM	1 640x350	2 640x400	3 640x480
fH (KHz)	31.469	31. 469	31. 469
A us (Line time total)	31.778	31. 778	31. 778
B us (Sync. Pulse width)	3.813	3. 813	3. 813
C us (Back porch)	1. 907	1. 907	1. 907
D us (Active)	25.422	25. 422	25. 422
E us (Front porch)	0.636	0. 636	0.636
fV (Hz)	70. 086	70. 806	59.940
P ms (Frame time total)	14.268	14. 268	15. 253
Q ms (Sync. pulse width)	0.064	0. 064	0. 064
R ms (Back porch)	1. 907	1. 112	1. 049
S ms (Active)	11.122	12.711	15.762
T ms (Front porch)	1.176	0.381	0.317
	Separate Sync.	Separate Sync.	Separate Sync.
Horizontal Sync. Polarity	Positive	Negative	Negative
Vertical Sync. Polarity	Negative	Positive	Negatove
Interlaced	No	No	No

Preset Timing

MODE ITEM	4	5	6
	640x480	800x600	1280x1024
fH(KHz)	37.5	46.8	63.75
A us (Line time total)	26.667	21.333	15.686
B us (Sync. Pulse width)	2.032	1.616	1489
C us (Back porch)	3.81	3.232	1.997
D us (Active)	20.317	16.162	11.62
E us (Front porch)	0.508	0.323	0.58
fV(Hz)	75	75	59.747
P ms (Frame time total)	13.333	13.333	16.737
Q ms (Sync. pulse width)	0.08	0.064	0.047
R ms (Back porch)	0.427	0.448	0.596
S ms (Active)	12.8	12.8	16.062
T ms (Front porch)	0.026	0.021	0.032
	Separate Sync.	Separate Sync.	Separate Sync.
Horizontal Sync. Polarity	Negative	Positive	Positive
Vertical Sync. Polarity	Negative	Positive	Positive
Interlaced	No	No	No

Preset Timing

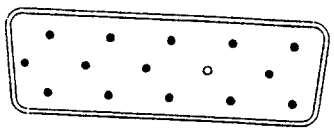
MODE ITEM	7 1280x1024	8 1280x960	9 1600x1200
fH(KHz)	68.677	79.976	75
A us (Line time total)	14.561	12.504	13.333
B us (Sync. Pulse width)	1.016	1.067	1.185
C us (Back porch)	2.201	1.837	1.877
D us (Active)	10.836	9.481	9.877
E us (Front porch)	0.508	0.119	0.395
fV(Hz)	84.997	75.025	60
P ms (Frame time total)	11.765	13.329	16.667
Q ms (Sync. pulse width)	0.044	0.038	0.040
R ms (Back porch)	0.524	0.475	0.613
S ms (Active)	11.183	12.804	16
T ms (Front porch)	0.014	0.012	0.013
	Separate Sync.	Separate Sync.	Separate Sync
Horizontal Sync. Polarity	Negative	Positive	Positive
Vertical Sync. Polarity	Negative	Positive	Positive
Interlaced	No	No	No

Preset Timing

MODE ITEM	10 1600x1200
fH(KHz)	93.7
A us (Line time total)	10.667
B us (Sync. Pulse width)	0.948
C us (Back porch)	1.501
D us (Active)	7.901
E us (Front porch)	0.317
fV(Hz)	75
P ms (Frame time total)	13.333
Q ms (Sync. pulse width)	0.032
R ms (Back porch)	0.491
S ms (Active)	12.8
T ms (Front porch)	0.01
	Separate Sync.
Horizontal Sync. Polarity	Positive
Vertical Sync. Polarity	Positive
Interlaced	No

Signal Connector

Pin 1 Pin 5



Pin 11 Pin 15

Signal Connector

Pin	Mode
1	R
2	G
3	B
4	Ground
5	Self Test
6	Video Return
7	Video Return
8	Video Return
9	NO PIN
10	Digital Ground
11	Self. Test
12	SDA
13	H-Sync
14	V-Sync
15	SCL

Adjustment Guide

1. Chrome-2000 Signal Generator
2. Assistant Ruler or Alignment Mask
3. Brightness Meter
4. Adjustment Tube and " - " Type Screw Driver
5. High-Voltage Probe
6. Digital Voltage Meter(DVM)
7. Degaussing Coil
8. Color Analyzer (MINOLTA TV-2130)
9. D.C Power Supply

Presetting Adjustment

1. Set Brightens and Contrast to the maximum position.
2. Set the main board VRs(VR501,VR502,VR901) to the mechanical center.
3. Timing

   Basically ,the timing is set to mode 1 cross-hatch pattern for adjustment .If you will use the other mode ,refer to the Input Signal Timing.
4. Turn on the power switch .Adjust the VR901 to enable that the 47.0VDC output voltage is in the range of 47.0±0.2VDC.Then check the other four output voltages to see whether they meet the following specifications.

   (a) 14.5 VDC+0.5 /–0.2 0 VDC (b) 80 VDC ± 4.0 VDC

   (c) 110VDC ± 5.0 VDC (d) 7.2 VDC ± 0.5 VDC.
5. High Voltage and Brightness Adjustment

   (a) Set the Chrome 2000 pattern generator to M10.

   (b) Set Brightness and Contrast to the minimum.

   (c) Adjust VR502 to get that the anode voltage is 26.0 ± 0.2KV

   (d) Adjust FBT screen VR to make G2Voltage=600V.

   (e) Set G1 Voltage to make the raster just visible.

6. Phase Adjustment

(a)Press the Menu Button to enable the OSD window.

(b)Press the Menu Key to enable the H-phase function.

(c)Adjust" ◀ "or" ▶ "Key to set video on the middle of screen.

(d)Press the menu key to enable the V-center function.

(e)Adjust " ▲ "or" ▼ "key to set video on the middle of screen.

7. Focus Adjustment

(a)Set the Chrome 2000 pattern generator to 68KHz.

(b)Adjust the FBT Focus VR(H.V.) to make that the corners and center look very clear.

8. High Voltage Protection Circuit

(a)Set the chrome 2000 pattern generator to 31.5KHz

(b)Set the Brightness and Contrast to the minimum position.

(c)Adjust VR502 to let anode voltage be over 29 ±1KV.

Check that the high voltage protection circuit can operate when the high voltage is in the range of 28 KV~ 30KV.

(d)Turn the power off. Re-adjust VR502 to the original position.

(e)Turn the power on. Re-adjust VR502 to enable that anode voltage is in the range of 26.0KV±0.2 KV.

Final adjustment

1. Check the high voltage protection function.
   (a) Set the Chrome 2000 pattern generator to 31.5.
   (b) Adjust VR502 until the anode voltage reaches 29KV ± 1KV. Confirm that the high voltage protection circuit can operate to enable that the anode is under 0.1KV. Turn the power off.
   (c) Re-adjust VR502 to the original position. Then turn the power on.
   (d) Re-adjust VR502 to enable that the anode voltage is in the range of 26.0V ± 0.2KV.
2. Raster White Balance Adjustment
   Warm up the unit about 30 minutes. Degauss the CRT screen, using the external degaussing coil.
   (a)Set the Chroma-2000 pattern generator to M1.(without video pattern)
   (b)Set the Brightness to the maximum and the Contrast to the minimum by OSD control.
   Adjust the Screen VR to make G2 =600±5V then adjust Sub Brightness (OSD Service Menu G1 ICON) to make background brightness =0.5FL±0.1FL
   (d) Enter the OSD function, and adjust the raster color temperature ICON to the following default values.
   x = 0.281 ±0.020
   y = 0.311 ±0.020
   (e)Re-adjust Screen VR to get the Brightness(Y) 0.6~1.5 F. L. Check x and y values. x = 0.281 ± 0.020 y = 0.311 ± 0.020
3. Video White Balance Adjustment
   (a) Set the Contrast to the maximum and the Brightness to the maximum.
   (b) Set the Chrome 2000 pattern generator to mode 1 pattern 3 70x70mm^2 window white pattern.
   (c) Adjust Video gain of red to get Y= 11 F. L.±1 F. L.(window red pattern)
   (d) Adjust Video gain of blue to get X=0.218±0.020 adjust Video gain of green to y=0.311± 0.020. 50 < y < 55F.L.
   (e) Set the Chroma 2000 pattern generator to model pattern 2 full white pattern.
   (f) Enter the OSD pattern : select "ABLADJAST " ICON and adjust using " ◀ "or " ▶ "key to make Y=29~32FL.
   (g) Check the white color temperature and color tracking to get the following values:
   x=0.281+/- 0.020 y=0.311+/- 0.020
   Y=5~MAX.F.L.

4. Size Range: adjust the picture size of each mode to get H=350 +/- 4mm and V=262 +/- 4mm

5. Horizontal and Vertical Linearity

Use cross-hatch pattern and set timing from M1 to M9. Check that the horizontal and vertical linearity must meet the following specification:

Vertical Linearity ≤5%

Horizontal Linearity ≤5%

Horizontal Linearity

$$\left|\frac{Xmax-Xmin}{Xmax+Xmin}\right| \times 100\%$$

Vertical Linearity

$$\left|\frac{Ymax-Ymin}{Ymax+Ymin}\right| \times 100\%$$

6. Focus Adjustment

(a) Change timing to M6 mode Pattern 63 (full white pattern)

(b) Set the brightness to let the raster just disappears. Then set the contrast to get the luminance 20FL.

(c) change pattern to pattern 59 (character pattern)

(d) Turn the FBT Focus knob to let that the characters at the four corners of the screen look very clear.

7. Convergence Adjustment

(a) Switch timing to M2 pattern 51 (cross-hatch pattern)

(b)Adjust the H-Size and V-Size to get the display size 350mm x 262mm.

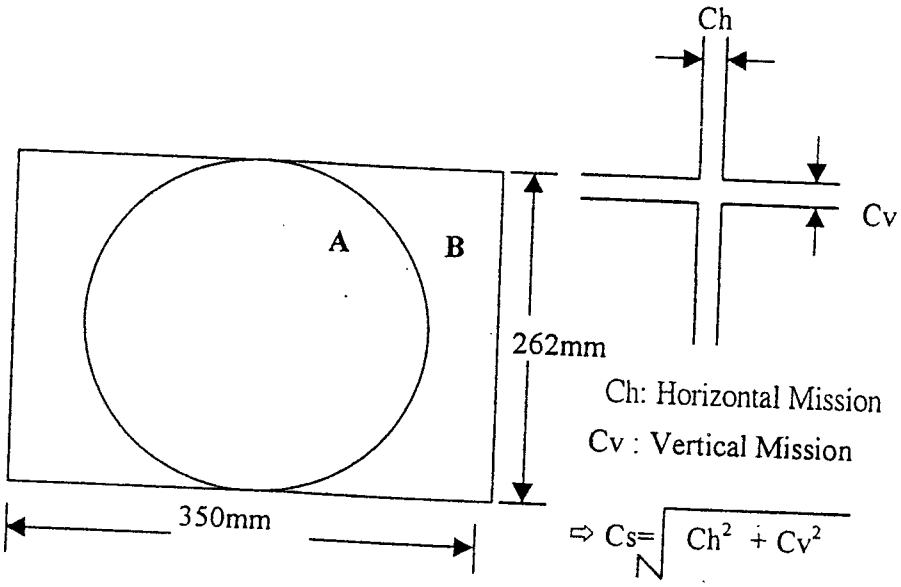
(c) Set the brightness to let the raster just disappears.

Switch pattern from pattern 51 (cross-hatch pattern) to pattern 63 (full white pattern). Then turn the Contrast to get the luminance 20F.L.

(d) Switch pattern to pattern 51 (cross-hatch pattern).Adjust CRT magnetic ring in compliance with the following convergence specifications

A:0.30mm

B:0.40mm Cs ≤0.5mm



Ch: Horizontal Mission

Cv : Vertical Mission

⇨ $Cs=\sqrt{Ch^2 + Cv^2}$

8. High Voltage Regulation

(a) Change timing to M9 Black and White pattern.

(b) Set the brightness and Contrast to the maximum luminance position.

(c) Check that the horizontal and vertical size variation must be less that 3mm.

(d)Change pattern to full white pattern.

(e)Set the brightness and contrast form the maximum luminance position to the minimum.

(f)Check if the horizontal and vertical size variation is less than 3 mm.

9. PnP DDC1→DDC2B

(a)Start the test with a test floppy.

(b)Insert the floppy into "A" drive.

(c)Key in "P TE988"

(d)Press "N" Key to start the test. Press "R" Key to end the test.

(e)The test will be initialized in the following sequence:

1.DDC1 communication test

2.DDC2B communication test

(f)When the communication test terminates, the following message will be shown on the right of the screen.

[ITEMS]

DDC1Data check O.K.

DDC2B data check O.K.

10. Enter Service function

(a) Press Menu Key at first.

(b) Choose tools function by re-press MENU Key.

(c) Press " ∇ " Key make green cursor stay in tea-time position and hold on " ∇ " Key for about 15 seconds.

(d) Window will change to Service Manual pattern.

Circuit Guide

1. DC Power Supply

EMI Filter Circuit

This circuit uses L (FL9001~FL902) and C (C901~C904) filter circuit to protect the power supply from noise during switching because that will interfere the voltage source via the power cord.

2. Power Start Circuit

The start circuit is composed of Q903 , Q904, R915, R917, R916, R918, ZD902 and C923 to get the fixed current to start up IC902.

3. Feedback and PWM Circuit

The feedback functions by use of the voltage sensed by R924.The voltage will input to IC902 pin 3 via R923 and will output to IC902 pin 6 after it is compared with IC902 pin 2(whose voltage is got after passing the divided circuit composed by R938,R939, and VR901 and the amplification and compensation circuit composed of R934,R927, C919,and C920)to Push Q901 to do switching for PWM function so that the output voltage of T9011 is very stable.

4. LED Indication, OFF mode (Saving)and Sync Circuit

(1) Sync

The Sync ±signal enter IC901 pin 4 through C924, D911,D912, R931and C918 to synchronize T901 with H-Sync

(2) LED Indicator and Off mode

In the ON mode, the Sync ±signal will illuminate the Green LED (Q906 is ON) through D910,C925,and LED 901 .In the Stand-by or Suspend mode, no voltage is provided by the Sync ±signal but only C923 provides the LED901 with voltage to illuminate the orange LED . In the OFF mode,Q906 will switch on and off so the voltage is provided to Q927 by T902 and IC901and Q925 will switch on and off so the LED blinks.

5. Output Rectification Circuit

T901 stores the energy by switching Q901 and releases the energy through D951, D952, D953,D954 and D955.

(D951,C952),(D952,C954), (D953,C955) , (D954,C956), and (D955,C958)constitute 47V, 110V, 80V , 14.5V, and 7V rectification / filter circuit separately. R964 connects to IC951 input via 14.5V and a stable voltage 5V is got from IC951 output to provide CPU circuit.

IC952 gets a stable output voltage 12V provides Time- base IC (IC501) for B saving (stand-by & suspend).

6. Power Saving Circuit

If no H-Sync and V-Sync input, IC602 PIN 27 will send a low level signal IC903. IC903 will turn on Q907, Q908 turn on and limit pin 2 of IC902 below 1V. then it will turn off to complete power saving .

When H-Sync input again, H-Sync will turn on Q958 to mask IC904 on and Q909 will on mask Q908 off then IC902 will actives. Power start again.

7. DC/ DC Converter Circuit

The monitor uses a Boost DC-DC converter to raise the voltage from 47V to 184V(depending on the horizontal frequency and load). IC501 contain a building PWM IC, whose output pin 6 switch on/ off Q951.When Q951 is ON, L901 will store energy and when Q951 is OFF ,L901 will release energy from 47V and via ,C963 to the FBT (horizontal output). The FBT pin 12 provides a reference voltage as a feedback signal through R5A2, R5A3, and VR502 , C550 to IC501 pin 5 enable that the high voltage becomes stable 26Kv during Fh=31~27KHZ. R955 is current sense resistor to detect L901 current.

8. Digital Control Circuit

This circuit contain IC602 its circumferential parts , IC602 pin 25 and are I^2C bus input signal and parallel with IC501 directly .

The H-Sync signal inputs from IC602 pin 42 and pin36 will output a fixed polarity.

The V-Sync signal inputs from IC601 pin 1 and 37 will output a V-Sync signal working as the time base of monitor.

CS Control (CS0~CS3)

the following table shows the control status: (IC602 pin 10~13)

FREQUENCY	CS	CS0	CS1	CS2	CS3
31~33KHZ	1	1	1	1	824PF ON 0
33~36.5KHZ	1	0	0	1	824PF ON 0
36.5~40KHZ	1	0	1	0	824PF ON 0
40~44.5KHZ	1	0	0	0	824PF ON 0
44.5~49KHZ	1	0	0	1	824PF OFF 1
49~59KHZ	1	1	1	0	824PF OFF 1
59~62KHZ	1	1	1	0	824PF OFF 1
62~70KHZ	1	0	1	0	824PF OFF 1
70~76.5KHZ	1	1	0	0	824PF OFF 1
76.5~79.2KHZ	1	1	0	0	824PF OFF 1
79.2~83KHZ	1	1	0	0	824PF OFF 1
83~99KHZ	1	0	0	0	824PF OFF 1

9. Horizontal (Time Base) Circuit

The horizontal signal inputs from IC501 pin 15 and pin 8 will output a fixed duty ON/OFF signal (the signal synchronizes with pin 29 and the duty will be modulated by H-Frequency) after the procession done by IC501. H-phase is determined by the voltage of IC501 pin 26. The free-running frequency is determined by R517, R518, & C512. If C501 pin 30 is low and this IC will stop working.

μμμ

10. Horizontal Output Circuit

(a). The H-Drive signal (IC501 pin 8) passes through C519, Q506, T501, R545 and Q504 to switch On/Off Q504 and triggers the FBT, C525, C526, D516 and D157 to output the high voltage (about 26KV).

(b). The linearity coil (L503) will be paralleled with L504 when use in higher frequency (control by IC501) to mask linearity better.

11. Vertical Circuit

The V-Sync signal inputs to IC501 pin 12 and 13 then , send to Ic401 pin 1 and 2 and the signal will output from IC401 pin 6 after the procession done by IC401. Vertical freerum depend on C516 & R520.

The blank signal talk from IC401 pin 8 via R408 connect to Q518 to Amplifier and via Q547 to CRT G1. IC602 pin 9 will output a low signal to pull down base voltage of Q517 to avoid suddenly high current in CRT screen.
The IC401 is a current amplifier with output pin 6 which can make the input of pins 1 & 2 differential amplification and will output from pin 6 to trigger V-DY.

12. Over Beam Current, Brightness, ABL and spot killer Circuit

Over Beam Current :

The OBC. Circuit is composed of Q604, R604, R633, Q639, R611, R612 & C607 VR502, R517, at once beam current raise too high be by IC602 pin 40 the video will be blank by IC602 to finish over current protection.

Brightness :

IC602 pin 35 O/P a PWM signal to Q206 (on video board) . The Q206 emitter voltage Will pull down the cathode voltage to control the brightness.

ABL :

After change CRT if the brightness of full white pattern is out of spec, you can get in "ABLADJAST" ICON of OSD, then press " "◁" or "▷" key to get proper brightness the control signal is come from IC602 pin 34.

Spot Killer:

IC602 pin 9 will O/P a low signal to pull high G1 voltage and disappear video picture when abnormal operation.

13. H-Size and Distortion Correction Circuit

This circuit contain Q601, C501, Q515 & Q514 , IC602 pin 20 O/P a PWM signal and get a DC level in C555 to control O/P level in pin 14 if IC502, if the DC level is higher, the size will be shrink. Pin 33 is compensated H-Size in mode- change pincushion is control by pin 11 of IC501 the parabola signal be amplified by IC502 and O/P from pin 14 to control the pincushion distortion. The other parameters of distortion (comer, trapezium , parallelogram, pin -balance) also control by this signal via I^2C bus from IC602.

14. Auto Degaussing

When power on at once IC602 pin 14 O/P a high level signal to turn on Q955 RL901 will on , degaussing coil will act6ive to finish degaussing function. The manual degaussing can also be finished via OSD function.

15.Raster Center Circuit

This circuit contain Q508 , Q509, VR501 etc. adjust VR501 you can move the raster horizontally to the picture center.

16. Dynamic Focus Circuit

The dynamic parabola signal come from pin 32 of IC501 and amplifier by Q501A. Then direct connect to focus pin of FBT and enter CRT.

17. Hi- Voltage Protection Circuit

If Hi-Voltage is raise to higher without limitation during abnormal condition will injure human health in this case.

The protection circuit : ZD501 and R511~R514 will active to shutdown high voltage.

Video Circuit Guide

1. TDA4885 is the pre-amplifier of I^2C BUS Control. Setting the increasing percentage to the contrast max. will obtain the value: 4.5VP-P - approximately 6 times of TDA 4885. The B^+ Range of IC is 7.6V~8.8V. Take 8V and use the regulation IC7808 to generate the following.

   A : Pin 6,8,10 working as the three-gun input pin are generally set to 0.7VP-P.

   B : The max. value of Pin 25, 30, 20 worked as the three-gun output pin is 4.5VP-P.

   C : Pin 21,22, 32 supply the DC BIAS Control with the DC voltage 4V~6V.

   D : Pin 17 supply the Beam Current Limiting with the start point within 4.5V~2V to control the Video gain of Full White Balance.

   E : The voltage of Pin 21,26,31 determining the Black Lever of Output is assigned to adjust the external brightness.

   F : Pin 5 Clamp Pulse is generated and supplied by the mother board – TDA4854.

   G : Pin 2,3,4 are assigned as OSD Mix Pin.

   H : Pin 15 is the SDA I^2C BUS Serial data input.

   I : Pin 16 is the SCL I^2C BUS Serial clock input.

2. IC204LM2405, The LM2405 is an integrated high voltage CRT driver circuit. The IC Contains three high input impedence, wide band amplifier which directly drive the R.G.B. cathodes of a CRT. The pin structure as follows:

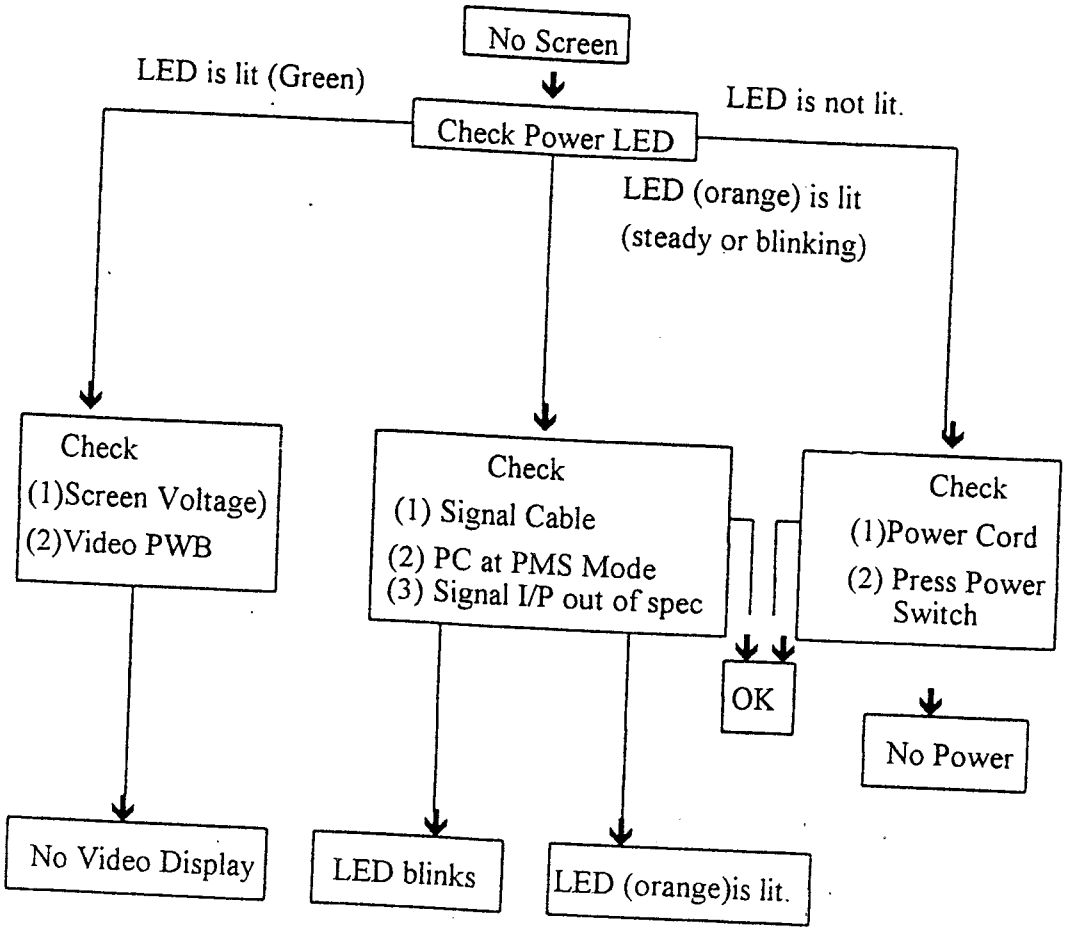
   #8, #9, #11 are signal input
   #1, #3, #5 are signal output
   #2, #4, #7 are ground
   #10 is BIAS voltage
   #6 is supply voltage

   The pixel clock frequency up to 130MHz.
   Output swing capability: 50Vpp for Vcc=80

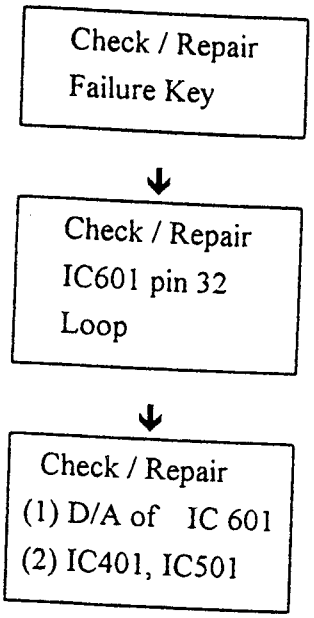
3. IC202 MC141545 records the OSD data onto the RAM. Press the MENU key ,then the OSD Window will be displayed for detailed adjustment. To start up, Pin9 and Pin4 require B^+ , Pin5 requires positive horizontal input signal, and Pin10 requires negative vertical input signal. The components connected by Pin2~5 are the Phase Locked-Loop. The component value cannot be mis-assigned otherwise the OSD Window cannot be held and the sharp edge of the OSD Window may occur.

Troubleshooting

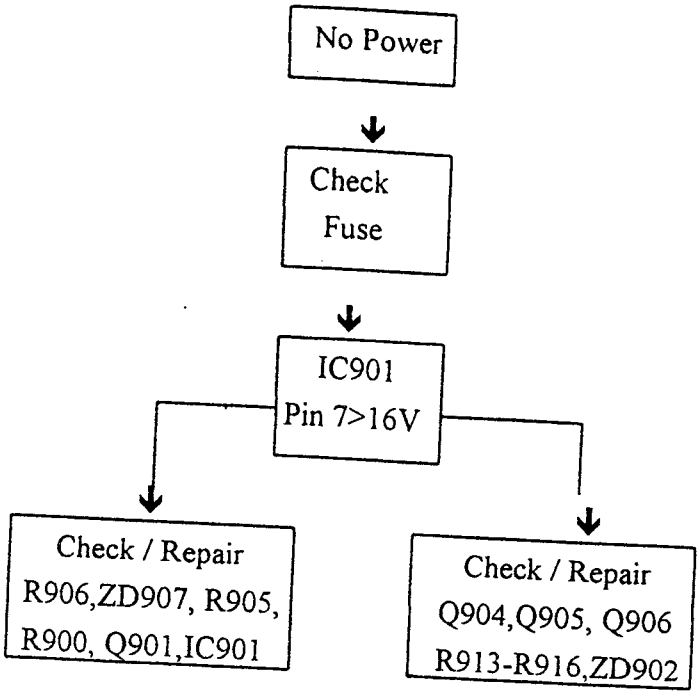
1.**No Screen**



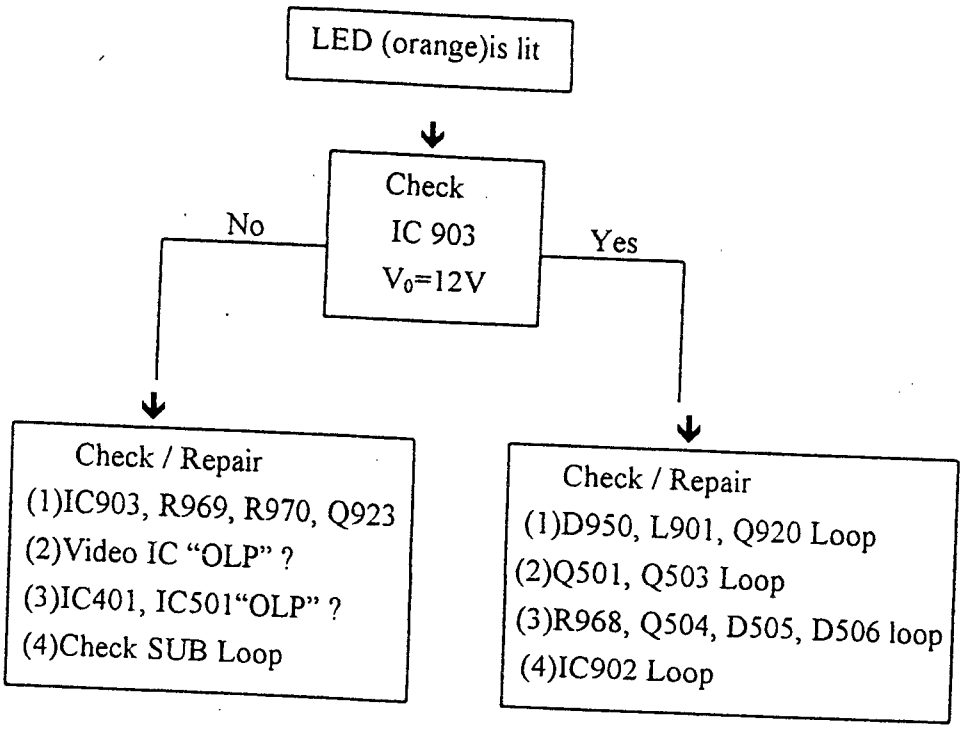
9. Exit Function/Adjustment Key Failure



2.No Power

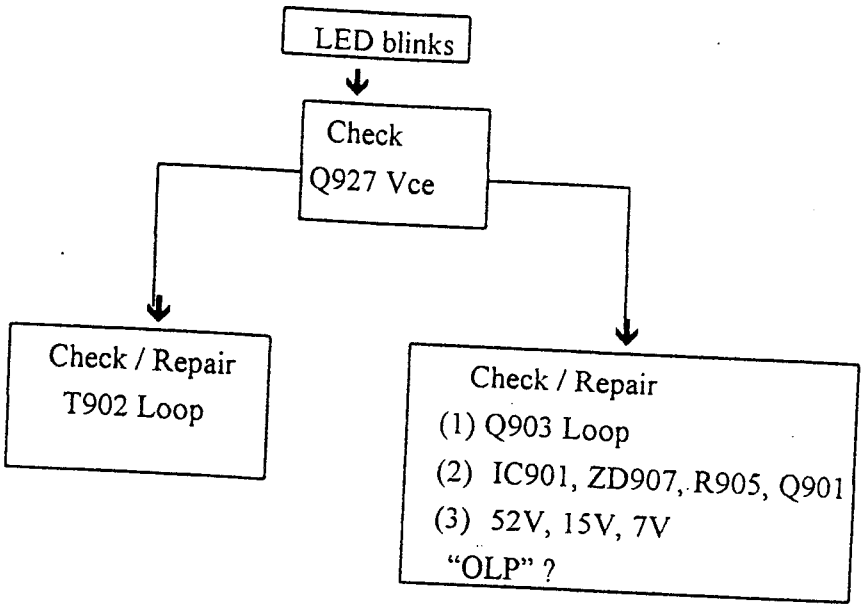

No Power
Check
Fuse
IC901
Pin 7>16V
Check / Repair
R906,ZD907, R905,
R900, Q901,IC901
Check / Repair
Q904,Q905, Q906
R913-R916,ZD902

3.LED (orange) is lit

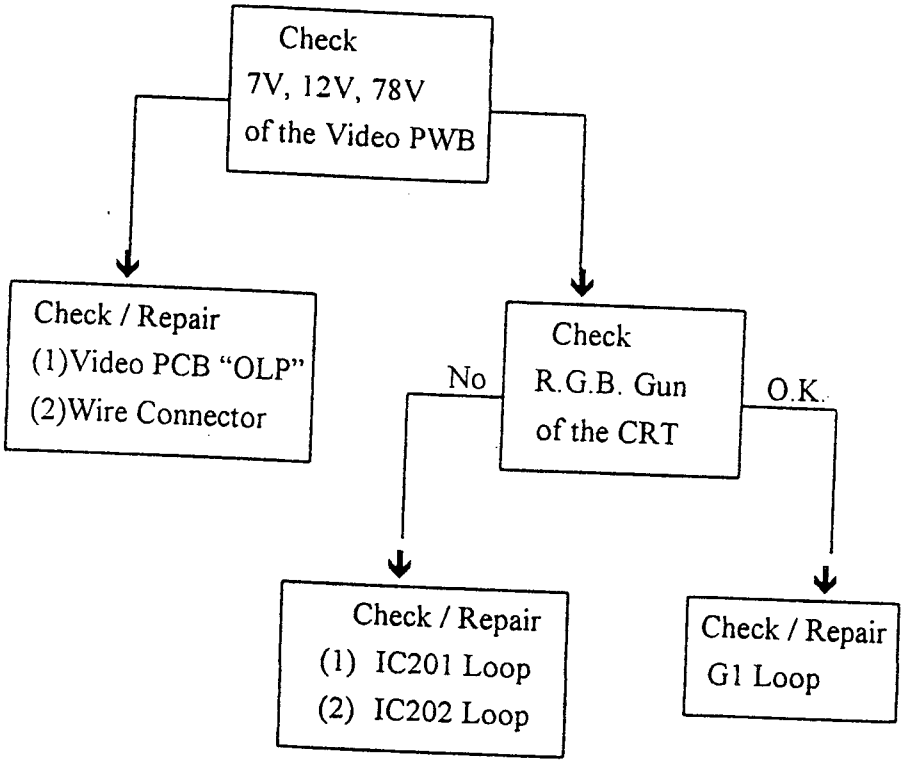


* * "OLP " means Over Load Protected.

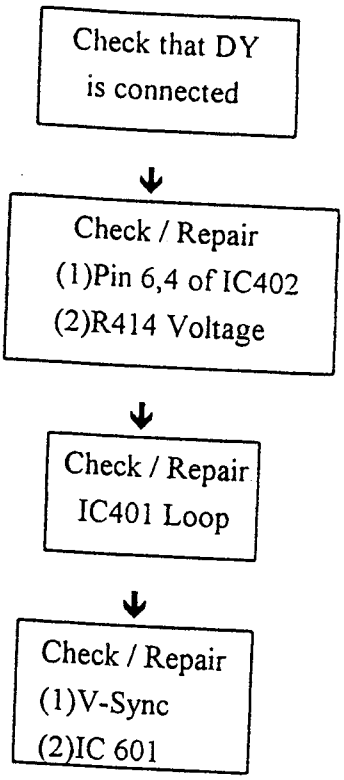
4.LED blinks


LED blinks
Check
Q927 Vce
Check / Repair
T902 Loop
Check / Repair
(1) Q903 Loop
(2) IC901, ZD907, R905, Q901
(3) 52V, 15V, 7V
"OLP" ?

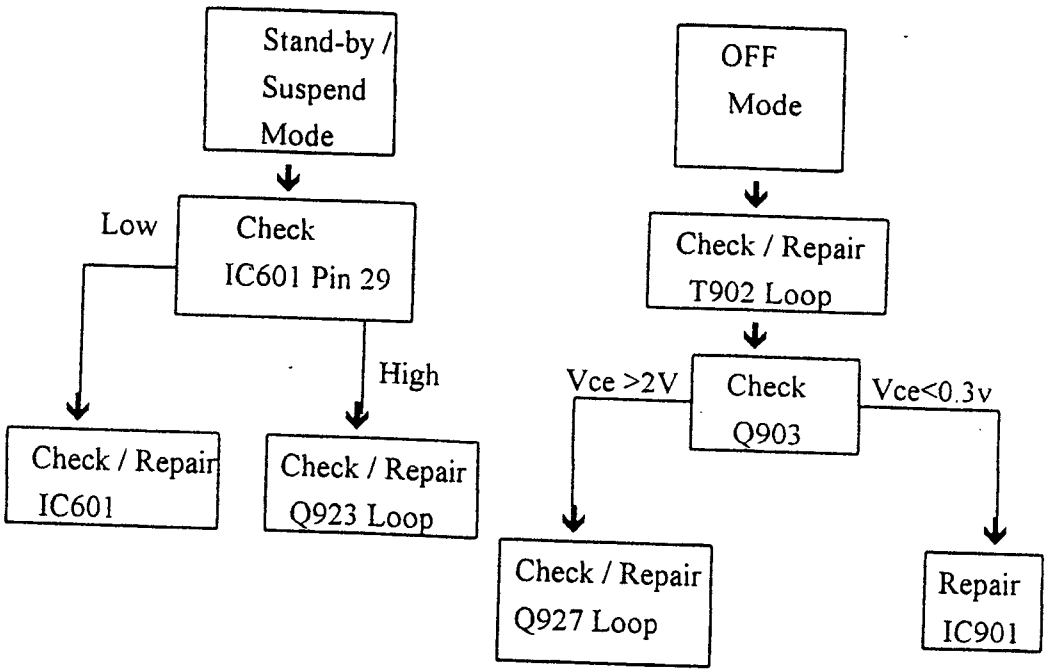
5.Video Display



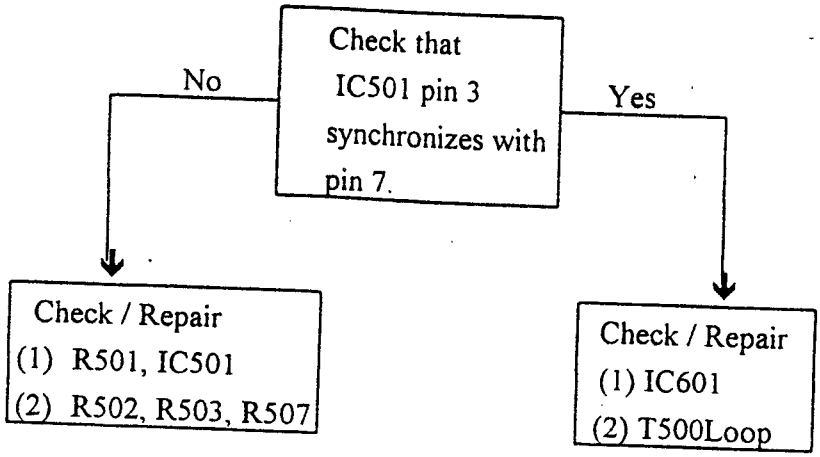
6. No Vertical Scan



7.Cannot work in the PMS Mode



8.No Hold (Horizontal)



WARNING

REPLACEMENT PARTS WHICH HAVE SPECIAL SAFETY CHARACTERISTICS

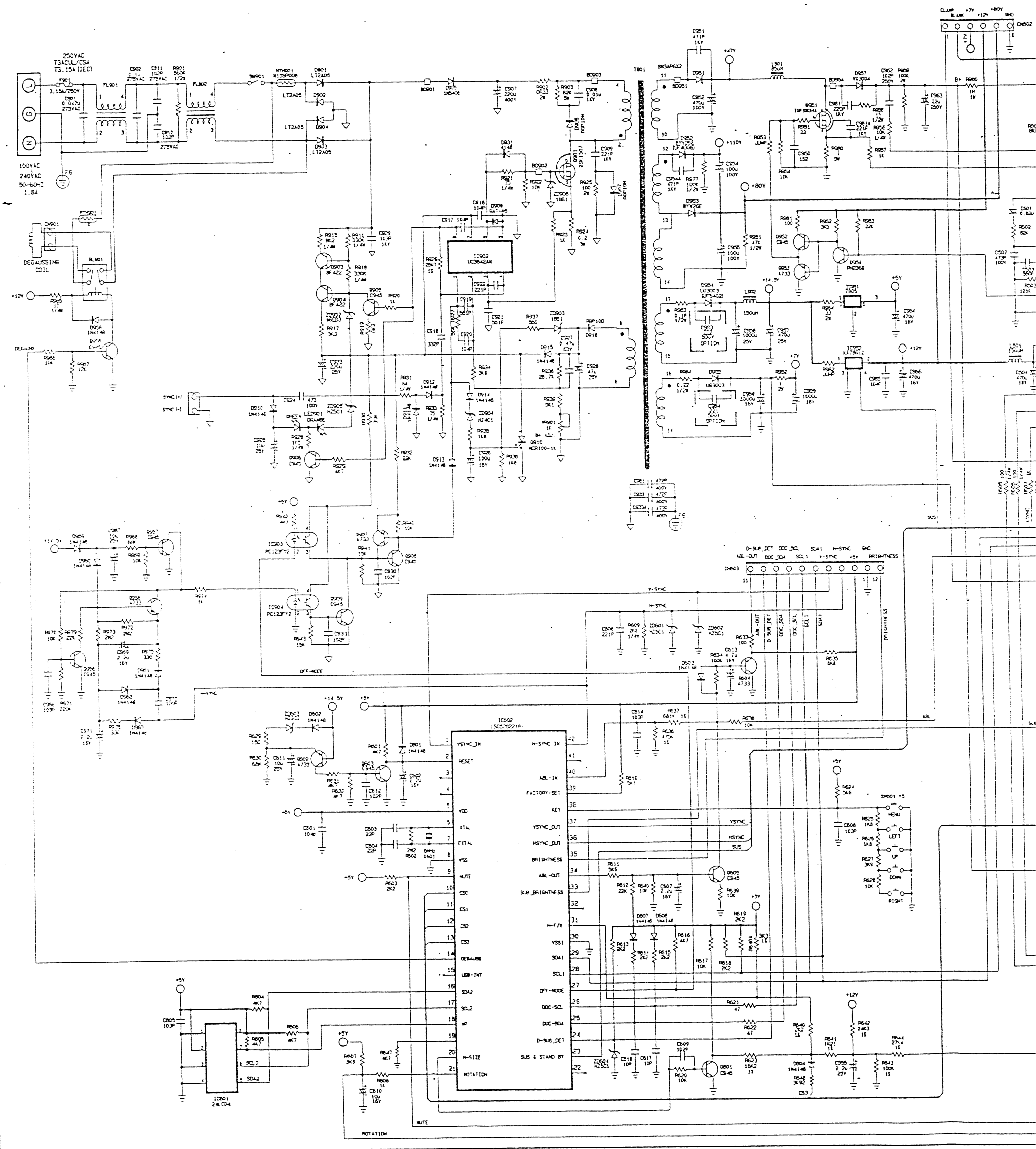
ARE INDENTIFIED BY ⚠ SHADING ON THE SCHMATICS REPLACEMENT THESE CRITICAL COMNONENTS WITH RECOMMENDED REPLACEMENT PARTS.

DON'T DEGRADE THE SAFETY OF SET THROUGH IMPROPER SERVICING.

CONTROL(S) MARKED * IS PERMANENTLY FROZEN.

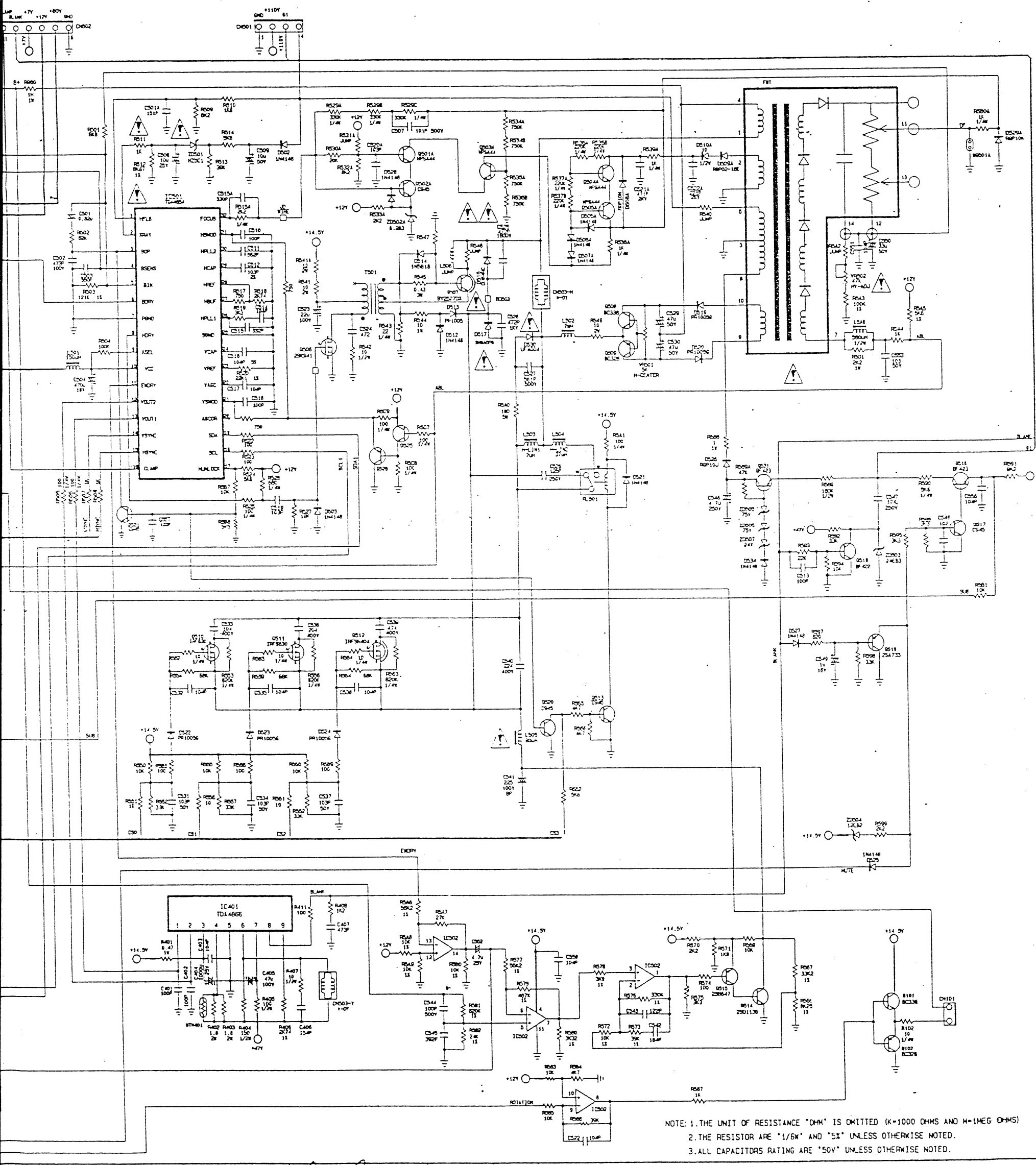
DON'T ATTEMPT TO DEFEAT OR IMPROPERLY REPLACE.

PARTS VALUES ARE SUBJECT TO CHANGE WITHOUT NOTICE.



E/C RECORD

REV.0



APPROVED	Warren Chen	14 . Feb. 2000			
CHECKED	Warren Chen.	14 . Feb. 2000			
DESIGN	Wangyuan Wu	02 . 14 . 2000	DWG. NAME	TE988 MAIN PWB (MAX DATA)	DWG. NO.
DRAWN	WU	02 . 02 . 2000			

Monxx 935

NOTE: 1. THE UNIT OF RESISTANCE "OHM" IS OMITTED (K=1000 OHMS AND M=1MEG OHMS)
2 THE RESISTOR ARE "1/6W" AND "5%" UNLESS OTHERWISE NOTED.
3. ALL CAPACITORS RATING ARE "50V" UNLESS OTHERWISE NOTED.

APPROVED			DWG. NAME	968 VIDEO BORAD (MAX DATA)	DWG. NO.
CHECKED					
DESIGN					
DRAWN	MU	02 . 14 . 2000			

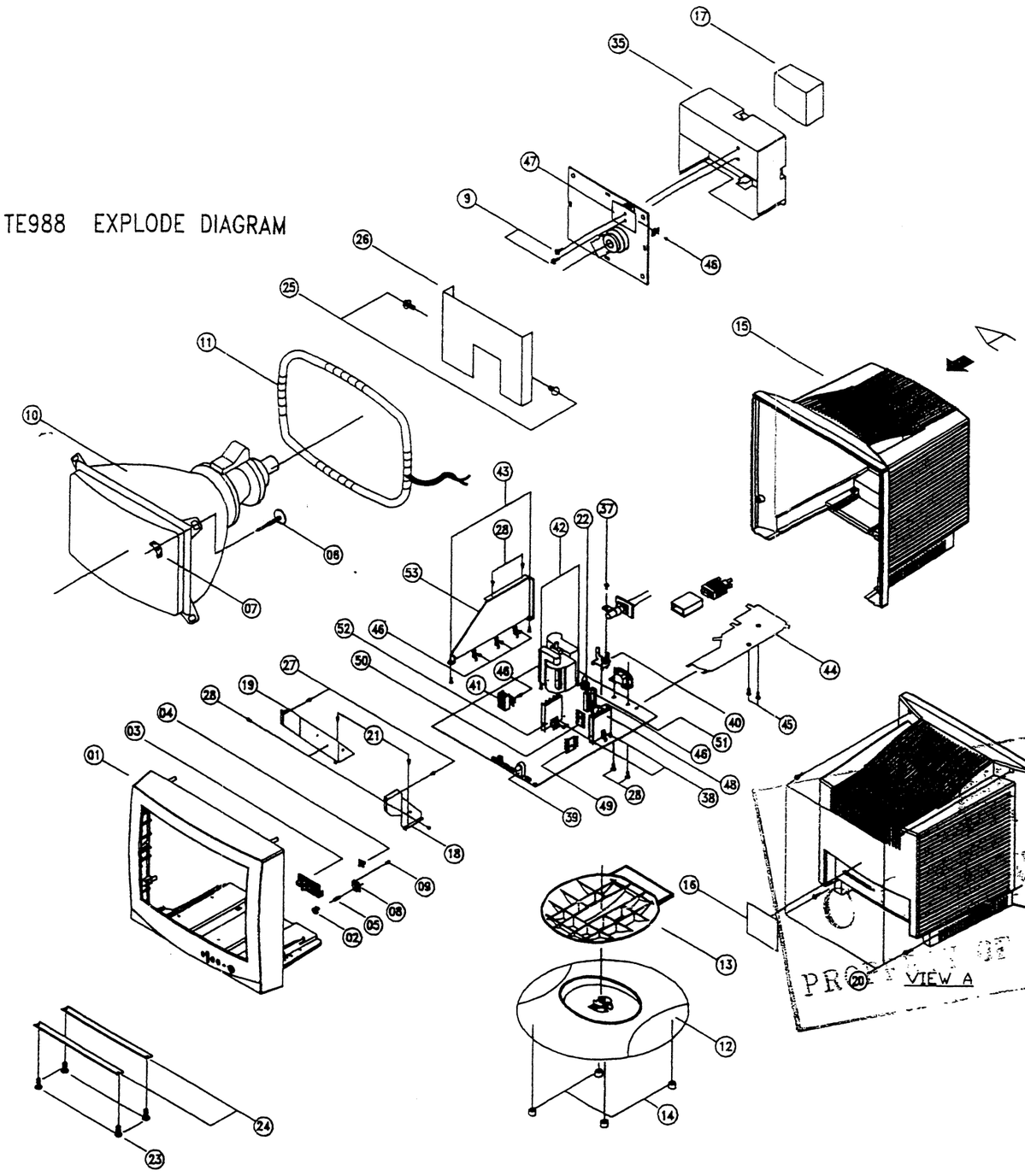
REV: 1

E/C RECORD

Monxx 995

項	件 名	件 號	材 質	尺 寸	重 量	備 註

TE988 EXPLODE DIAGRAM



NO	TITLE	TECO PART NO	QTY	REMARK
01	FRONT PANEL	7021301035716	1	MC-8510
02	BUTTON-P	7021453007912	1	
03	BUTTON-F	7021453008013	1	
04	LEN-P	7021404010916	1	
05	SPRING	7021874004815	1	
06	SCREW SPECIAL	780XX00216140	4	
07	SUPPORT	7021504016016	4	
08	SUPPORT BUTTON-P	7021453008111	1	
09	SCREW	780PB3C08CA00	3	PB 3X8
10	CRT	*	1	
11	COIL DEGAUSSING	*	1	
12	BASE	7021401007710	1	
13	SWIVEL	7021401007418	1	
14	CUSHION	7021614014019	4	
15	BACK COVER	7021311019531	1	MC-8510
16	LABLE DHHS	7021764055619	1	
17	CUSHION	7021614012016	1	
18	SUPPORT(L)	7021502009012	1	
19	SUPPORT(R)	7021502009110	1	
20	SCREW	780PP4016CB08	4	PP 4X16
21	SCREW	780PB4008CB05	2	
22	PCB HOLDER	7021404011718	1	
23	SPECIAL SCREW	780XX00099241	4	
24	SUPPORT(BOT)	7021503013218	2	
25	SNAP RIVET	7021404016213	2	
26	SHIELD SHEET	7021513009812	1	
27	SPECIAL SCREW	780XX00206144	2	M4X8
28	SCREW	780PB4008CB05	6	PB 4X8
29	SCREW	780PB3006CA09	2	PB-3X6
30	POLYFOAM(T)	7021812005319	1	
31	POLYFOAM(B)	7021812005416	1	
32	CARTON	7021802056811	1	
33	PE SHEET	7021824001319	1	
34	PE BAG	7021824004024	1	
35	SHIELD CASE	7021511001636	1	
36	SUPPORT PCB	7021404003715	1	
37	SCREW	780PS4008CB06	1	PS 4X8
38	SCREW	780PG3010CA07	3	PG 3X10
39	LED HOLD	7021404011513	1	
40	SUPPORT	7021503012912	1	
41	HEAT SINK	7021524014419	2	
42	SCREW SPECIAL	780XX00165146	2	
43	SCREW	780PS3008CA01	2	PS 3X8
44	SHIELD	7021513009511	1	
45	SPACER SUPPORT	7021404016019	2	
46	SCREW	780PG3008CA06	7	PG 3X8
47	HEAT SINK	7021523008512	1	
48	HEAT SINK	7021523008610	1	
49	HEAT SINK	7021524010910	1	
50	HEAT SINK	7021524015211	1	
51	HEAT SINK	7021524014516	1	
52	HEAT SINK	7021523008415	1	
53	HEAT SINK	7021522001123	1	

製圖 REVISION		核定 APPROVED BY	C.L.Lang	6-2-'99	比列 SCALE	圖名 Monxx 995
		審查 REVIEWED BY	王連春	6.2.99	X	DRAWN NAME ASSEMBLY DRAWING
		設計 DESIGNED BY	林豐誠	6/2'99	M M	
		製圖 DRAWN BY	林豐誠	6/2'99		ME 圖號 DRAWN NO
		規範 VENDOR				